REMARKS

I. Status of the Claims

Claims 1-11, 13-17, and 26-33 are pending. Claims 1-11, 13-15, 26-27, and 29-33 are rejected. Claim 28 is objected to as being dependent from a rejected independent claim, but would be allowable if rewritten in indpendent form with all of the limitations of the base claim and any intervening claims. The status of Claims 16-17 is presently unclear in that they have not been objected to or rejected under §102 or §103 in the Office Action.

Claims 1-3, 7-8, 10-11 and 14 are rejected under 35 USC §102(e) as anticipated by US Patent 6,547,286 (White et al.).

Claims 4-6, 9, and 13 are rejected under 35 USC 103(a) as unpatentable over White et al. in view of the article "Fabrication of Ceramic Membrane Tubes For Direct Conversion of Natural Gas" by Balachandran et al. (hereafter "Balachandran et al.).

Claim 15 is rejected under 35 USC §103 (a) as unpatentable in view of White et al.

Claims 26-27, 30, 32-33 are rejected under 35 USC 103(a) as unpatentable over White et al. in view of US Patent 5,240,769 (Ueda et al.).

Claims 29-31 are rejected under 35 USC 103(a) as unpatentable over White et al. in view of Ueda et al. as applied to Claim 26, and further in view Balachandran et al.

II. Concerning the Amendments

Applicants have amended Claims 1, 7, 11 and 26 to clarify that the joint comprises a girdle of a metallic material capable of undergoing plastic deformation without rupture. Support for the amendment is at page 7, lines 7-9 of the Specification. These claims are also amended to clarify that differential pressure across the joint provides compressive force upon the girdle through the mating surfaces thereby forming and maintaining a joint resistant to fluid leakage. Support for this amendment is at page 7, lines 11-14. The claims are also amended to clarify that the girdle is of a resilient material. Support exists at page 1, lines 6-11 of the specification.

III. The Claimed Invention

In one aspect, the present invention relates to a joint resistant to fluid leakage, which joint comprises:

a girdle of a resilient metallic material capable of undergoing plastic deformation without rupture,

a first rigid member with a tapered outer mating surface, and

a second rigid member with a tapered inner mating surface,

the girdle being disposed between and contiguous with the tapered mating surface of the first rigid member and the tapered inner mating surface of the second rigid member, wherein differential pressure across the joint provides compressive force upon the girdle through the mating surfaces thereby forming and maintaining a joint resistant to fluid leakage through the joint.

The joints of the present invention are particularly advantageous for joining gas-tight members having different coefficients of thermal expansion, wherein a difference in fluid pressure across the joint provides compressive force upon the girdle, and thereby forms and maintains a joint resistant to fluid leakage. See, Specification at page 1, lines 4-11. In embodiments, the girdle used in forming the joint may comprise a composite resilient material. Specification at page 1, lines 11-16 and page 7, lines 18-29. The joint may eliminate a need for mechanical devices to hold the joint in place. Specification, at page 4, lines 7-9.

IV. Concerning Resection under §102(b).

Claims 1-3, 7-8, 10-11, and 14 are rejected under 35 USC §102(e) as anticipated by the teachings of White et al. The Office states White et al. disclose a joint assembly for joining a ceramic membrane to a tube sheet to support the ceramic membrane within a reactor. The Office continues by stating the sealing material employed can be a "brazing material" which can be effected by "known brazing techniques". It is also said that the brazing material is known to be a metallic material and that the "brazing process plastically deforms the brazing material." Applicants disagree that White et al. teaches or suggests the use of a solid member, i.e., a girdle, and that such a girdle member is comprised of a resilient material subject to plastic deformation upon application of differential pressure across the joint as claimed herein. Applicants respectfully traverse the rejection.

The sealing material the Office is apparently pointing to in the White et al. patent is identified as 28 on Figure 3 of the reference. At column 5, lines 49-56 of he reference it is said:

"As may be appreciated, other types of sealing material 28 can be used in place of high temperature roe sealing material 30. For instance, sealing material 28 could be a conical gasket fabricated from either a graphite sheet, a ceramic fiber mat or felt, or a combination of graphite and ceramic fiber. The ceramic-to-metal seal could be effected by known brazing techniques; and

in such case, sealing material 28 would be brazing material."

No other teaching is mentioned by White et al. with respect to brazing.

Brazing is a joining process where a non-ferrous metal or alloy is heated to its melting temperature and distributed between two or more close fitting parts by capillary action to effectuate a seal. See, Wikipedia online encyclopedia of November 28, 2007 - http://en.wikipedia.ora/wiki/Brazing. Heat is applied to melt the brazing material, which then interacts metallurgically with the metals being joined to effectuate a seal. Brazing does not use a member, such as a girdle member as claimed, which is of a resilient material capable of plastic deformation upon being subjected to a mechanical force, i.e., differential pressure across the joint being formed. See e.g., Wikipedia online encycolpedia of October 20, 2008 - http://en.wikipedia.org/wiki/Plastic_deformation. The melting of solder or brazing material into a liquid form is not plastic deformation without rupture when a differential pressure is applied to the member as is claimed in the present invention. The solder or brazing material after melting is also clearly not in the shape it was in prior to brazing, and thus, is not even close to being a resilient material. Due to these significant differences, Applicants respectfully submit that the teachings of White et al do not anticipate the claimed invention herein. Applicants traverse the rejection and request withdrawal thereof.

V. Concerning Rejection Under §103 (a)

Claim 15 is rejected under 35 USC §103 (a) as unpatentable over White et al. The Office takes the position that a variety of alloys of metals such as silver, tin, zinc, and copper are commonly use as fillers for brazing materials. As discussed above with respect to brazing, heat is applied to melt the brazing material, which then interacts metallurgically with the metals being joined to effectuate a seal. Brazing does not use a solid member, such as a girdle as claimed, which is of a resilient material capable of plastic deformation upon being subjected to differential pressure across the joint being formed. The melting of solder or brazing material into a liquid form is not plastic deformation without rupture under differential pressure as claimed in the present invention. Due to these significant differences, Applicants respectfully submit that the teachings of White et al also do not fairly suggest the claimed invention therein.

Claims 4-6, 9 and 13 are rejected under 35 USC §103 (a) as unpatentable over White et al. in view of Balachandran et al. As discussed above, there are significant differences between the teachings of White et al. and the claimed invention. White et al. do not teach use of a sealing member of a resilient metallic material, such as the girdle as claimed herein, nor one that is capable of undergoing deformation without rupture under differential pressure as claimed. The teachings by White et al. suggest that the sealing material is converted to a liquid form by

brazing. The teachings of Balachandran et al. are directed, as the Office Action recognizes, to use of specific ceramic membranes. The teachings by Balachandran et al. are not directed to sealing members and thus, add nothing to the teachings by White et al.

Claims 26-27, 30, 32-33 are rejected under 35 USC 103(a) as unpatentable over White et al. in view of Ueda et al. As discussed above, there are significant differences between the teachings of White et al. and the claimed invention herein. Ueda et al. disclose a packing material for a shaft seal of a hydraulic machine, wherein such material also can include rubbers, resins and lubricants. See, column 2, lines 39-45 of the Ueda et al reference. It appears that the teachings of White et al (high temperature brazing) are inconsistent with the teachings of Ueda et al. as some materials employed by Ueda et al. would be unsuitable for a high temperature brazing-type process as taught by White et al. Applicants submit the combined teachings of these references do not fairly suggest the claimed invention.

Claims 29-31 are rejected under 35 USC 103(a) as unpatentable over White et al. in view of Ueda et al. as applied to Claim 26, and further in view Balachandran et al. The teachings of White et al., Ueda et al. and Balachandran et al are discussed above. Applicants submit that the combined teachings do not suggest the presently claimed invention for the same reasons.

As a result, Applicants submit that Claims 4-6, 9, 13, 15, 26-27, 29-33 are not rendered obvious in view of the teachings by White et al. in view of Ueda et al. and also Balachandran et al. Applicants respectfully traverse these rejections and request withdrawal thereof.

VI. Concluding Remarks

In view of the foregoing Amendments and Remarks, Applicants respectfully request that all rejections and objections to pending Claims 1-11, 13-17, and 26-33 be withdrawn and that such claims be reconsidered. Applicants submit all such pending claims are in condition for allowance and such is respectfully solicited at an early date.

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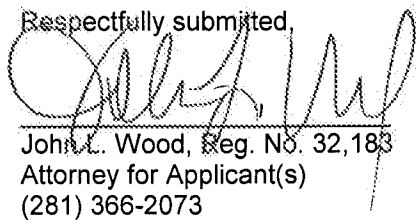
Respectfully submitted,



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